

# 2007 North Carolina A&T State University Research Annual Report

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## I. Report Overview

### 1. Executive Summary

#### OVERVIEW

The School of Agriculture and Environmental Sciences (SAES) continues to focus on its six strategic program initiatives: (1) Agromedicine, Nutrition and Food Safety, (2) Biotechnology and Biodiversity, (3) Human and Community Development, (4) International Trade and Development, (5) Small Scale Agriculture, and (6) Soil and Water Quality.

Overall, 2007 was a productive year with highlights and accomplishments in the following areas:

#### Program Growth

•For the first time, the School of Agriculture and Environmental Sciences (SAES) led the University in receipt of extramural funding with the highest amounts ever achieved for a program year. This occurred in part due to our success with meeting or exceeding funding goals for our six program initiatives. It also occurred as a result of our work funded through the Evans-Allen grants and receipt of capacity building grants. •The School of Agriculture and Environmental Sciences entered its second year as a partner in the new North Carolina Research Campus (NCRC) at Kannapolis, North Carolina. The NCRC is a generational opportunity that is certain to be one of the most advanced nutrition-related biotechnology facilities of its type in the world; the multi-billion dollar facility is being built on a 350 acre campus where the former Cannon Mills Plant once stood. The NCRC plans to combine the research power of universities in the University of North Carolina (UNC) system (which includes North Carolina A&T State University), Duke University, the cutting edge training from community colleges, and the know-how of private enterprises to create an exceptional biotech hub. The opportunity to participate in this new research consortium has grown largely out of our very active and successful research and demonstrated capacities involving the Agromedicine, Nutrition and Food Safety Initiative. Our primary research focus is on post harvest technologies, with specific emphasis on fruits and vegetables. A faculty summit was held to develop strategies that would enable all SAES departments to be involved in the NCRC consortium initiative. In addition to the main focus on food safety, functional foods, packaging and other post-harvest issues, we specifically identified areas of biomass utilization from by-products obtained from production of fruits and vegetables and economic analyses of potential commercial uses of those products as leading areas for full SAES faculty participation in the research.

•The SAES held a faculty summit in March to revisit and evaluate the six strategic program initiatives. Research faculty members evaluated the administrative support and offered suggestions on how the administration should restructure or better define the strategic initiatives. Strategic planning for the SAES for FY 2009 will include some additional restructuring to meet goals of the UNC system identified in the document entitled "University of North Carolina Tomorrow Commission: Final Report." One area of specific emphasis for all 17 of the UNC system campuses is "to become more directly engaged with and connected to the people of North Carolina, its regions, and our state as a whole." •The search conducted this past year for an evaluation specialist to work jointly with the Agricultural Research Program and Cooperative Extension did not result in filling the position. Search efforts will resume again this summer. This position is seen as a key factor that will help SAES improve the development, monitoring and collection of data for outcomes and impacts.

•Discussion of possibly combining our Plan of Work with North Carolina State University will begin in April, 2008.

#### Breakthroughs and Developments

•A patent on the alleviation of peanut allergens has led to a pronounced visibility of the research program at NCA&T. Its announcement last year resulted in over 318 news occurrences. The process is currently being evaluated in clinical trials by health researchers at the University of North Carolina at Chapel Hill. Once this stage is completed, we anticipate there will be a considerable number of opportunities to license the patent.

•An invention disclosure has been filed involving food safety with dairy products. This is in collaboration with Southern Illinois University.

#### Small Farms Assistance

•NCA&T continues its support of small scale agriculture, particularly in identifying alternative crops to tobacco and offering assistance and technical demonstrations on increasing profitability of small farms. Of particular focus this year was to provide business support and training workshops to farmers in growing and marketing mushrooms, adopting environmentally friendly field practices in tilling and water treatment, and developing sound business practices.

#### Coordination with Cooperative Extension

•The integration of the Cooperative Extension and the Agricultural Research Programs continues to be challenging, but NCA&T is making progress. Some of this has occurred by creating and filling two jointly appointed positions. Other efforts have included a pivotal meeting for researchers to increase their understanding of issues that families, groups and communities face that can be incorporated into research proposals involving research and outreach. Successful examples of collaboration between Extension and research include the development and training of mushroom production technology, Small Farms Week, and field days. A major challenge is to fill positions in Extension with positions that complement the interests and work of our research faculty.

#### Regional Projects

•One faculty member is participating in two regional projects which both focus on the international concerns of agriculture:(1) Impacts of Trade and Domestic Policies on the Competitiveness and Performance of Southern Agriculture (S-281), and (2) Economic Assessment of Changes in Trade Arrangements, Bioterrorism threats and renewable Fuel Requirements on the US Grain and Oilseed Sector (S-1016).

#### HIGHLIGHTS FROM PLANNED PROGRAMS

##### Agromedicine, Nutrition and Food Safety

•A research team identified natural bioactive agents with moderately strong anticancer properties from *Rosa canina* and *Phytolacca americana*. These bioactive agents may be helpful in cancer prevention and alternative treatment. In vitro tests showed that crude extracts from these plants significantly reduced the growth and proliferation of colon, breast, and cervical cancer cells (three prominent cancer types that affect both African-American men and women). The bioactive agents in the same extracts were also effective in boosting egg production in molting laying hens and could have potential use in the poultry industry. A new project was funded with outside funding to study the molecular mechanisms underlying the effects of the natural bioactive agents identified in this project as well as to test their safety through in vivo experiments. •Results testing the use of mushroom and pokeweed extracts as alternatives to antibiotics in pastured chickens were positive in enhancing the animals' health and significantly reducing Salmonella growth. The pokeweed extract given to laying hens resulted in a longer resting period and higher return to egg production. This continues work on finding alternatives to antibiotics in poultry that can contribute to both animal and human health.

•A study on probiotic supplements in food has demonstrated that many commercial products available in the market do not meet the standard for human health promotion. This simply means that most consumers are paying high prices for low quality. These results strongly suggest that the industry needs to pay closer attention to processing conditions in order to improve the viability of probiotic cultures. In this project, the scientists tested natural antioxidants for health benefits. They found that the antioxidants could provide protection for the probiotic cultures both during processing conditions, such as fermentation and drying, but also during storage at refrigerated temperatures. This approach to improve stability and viability of probiotic cultures is very practical and could be easily adopted and adapted by the industry. The addition of antioxidants also would provide extra health benefits to the commercial products and ensure the viability of probiotic cultures.

##### Biotechnology and Biodiversity

•A major effort in micropropagation protocol development continues to enhance production of important plant species. Farmers and nursery owners are participants in this study and the goal is increased marketability of highly desirable plant species.

•A study examining a new technology has substantially increased our research capacity in biofuels and biomaterials production. As the technology is further developed, it has the great potential for producing fuel ethanol and biomaterials from renewable sources that will impact rural economies by creating new cash crops for farmers and foresters and providing new jobs for the rural communities. With the production of fuel ethanol and bio-based products from domestic renewable sources, we could substantially replace oil imports of US. The use of 10% ethanol blends could also significantly reduce toxic emissions from automobiles, while reducing greenhouse gases and improving air quality.

- Research findings from a study involving functional food ingredients from NC agricultural by-products has the potential to positively impact the rural economy, the environment, and public health through production of health promoting compounds and inexpensive food preservatives from underutilized agricultural by-products such as peanut skins. Such value-added bioactive compounds have the potential to promote public health and add value to the agricultural sector. Efforts are in progress to license project outcomes to interested industry partners.

- The medicinal benefits ascribed to *G. frondosa* are responsible for the ever increasing demand for this mushroom for culinary uses and nutraceutical preparations. Research conducted during this period provides for more understanding of the biology of mating in *G. frondosa*. This continues to expand our knowledge and understanding in the cytology and breeding behavior, the lack of which has hampered the development of strains and commercialization of strains from local genetic sources.

#### Human and Community Development

- Leadership development in rural communities is essential for the growth of human potential but also for addressing community issues successfully over time. One study is assisting in the development of an instrument to assess the change in leadership resulting from training sessions of Community Voices. A Leadership Practices Inventory is being developed to provide this documentation. Preliminary results suggest the scale can differentiate important leadership actions considered critical in effective leadership among community groups.

- A new study emphasis focuses on the needs of amateur horse owners in North Carolina and specifically in the neighboring counties in the Piedmont region of the state, in which NCA&T is located. With over 6,000 horses in the area, the University can play an important role in addressing needs. Efforts are underway to develop a practical set of recommended practices for the care and handling of horses that will be produced for sharing with North Carolina Extension personnel and others such as the North Carolina Horse Council. Also, a set of training materials focusing on education needs/information relating to quality care/handling practices of horses will be developed for implementation. This is an example of listening to the stakeholders (horse owners and the industry) and designing research/Extension projects to address the needs.

- A cross-cutting project is underway in providing assistance to African American parents and their children in developing improved decision making skills in the selection of food types and portion sizes. The ultimate goal is to reduce or prevent childhood and adult obesity. The study is designed to identify factors influencing food choices and portion sizes and to develop effective strategies for better choices. Outcomes are expected to help improve the quality of life for parents and their children.

- Rural entrepreneurs in North Carolina are the target audience for development of training modules to assist in the business development of wine grape and pasture-pork production. This project is expected to promote in economic development of small businesses in the state.

#### International Trade and Development

- Through participation in the S-287 Southern Regional Project, NCA&T is seeking additional markets for products of farmers in the Southern region. This project has contributed to the information needed by North Carolina farmers concerning commodities to produce for the export market. In the case of China's accession into WTO, some studies have shown that at least \$5 per head for pork could be added to the profits of NC farmers. Also, farmers are beginning to understand that CBI and CAFTA were implemented by Congress to stimulate export of raw cotton and other agricultural commodities like oil seeds, fruits, and vegetables into these countries.

- One study is focusing on the impact of international and domestic economic conditions on farm production including fuel and labor costs. Farmers will be able to decrease fuel cost share by using more labor, capital, and fertilizer when fuel prices rise. However, if subsidies are cut as fuel prices rise over the coming decades, the present model of substitution predicts a substantial decrease in US corn production. Corn farmers are sensitive to wages, however, substituting energy for labor as wages rise. The combination of tougher immigration laws with rising diesel prices leaves little room for substitution. The estimated decreasing return to scale suggests overproduction of corn. Therefore, corn producers will scale down their production. This information is useful in advising North Carolina farmers in their business practices as related to international and domestic factors.

#### Small Scale Agriculture

- Specialty crops can provide lucrative markets for small scale agriculture in North Carolina. The results from a study indicate that income from the production and sale of eggplants averages about \$3,000 per acre. This project could provide a new crop for vegetable farmers, or for others interested in diversifying their operations.

•The green industry is North Carolina’s third largest agricultural industry. One project has the potential to further expand this industry by providing a new flowering ornamental useful for hanging baskets. Several experiments have improved the production of Clerodendrum thomsoniae through improved nutrients and growth regulators. So far, this work has resulted in the reduction of aborted flowers, thickened and curled leaves, as well as reducing delayed flowering.

• NCA&T is continuing experiments to improve outdoor swine production designed to assist small scale producers in the state. Outdoor hog farming has increasingly become an attractive supplemental source of income for many small-scale farmers in North Carolina. A current project is providing new knowledge that can help them become more productive while protecting natural resources. One experiment found no significant differences between the weights of indoor and outdoor pigs, and no significant effects of iron treatments, which suggests that farmers could save the money which is now spent on iron injection. A second experiment monitored ground cover depletion over three weeks. Sorghum was observed to have been destroyed the most by the gestating sows, while pearl millet was destroyed the least.

Soil and Water Quality

•Research findings have contributed to the body of knowledge in using no tillage, cover crops, and compost to improve soil quality. Growers have adopted beneficial agronomic practices based on study results. In addition, this study has determined the adequacy of integrating summer cover crops in vegetable production systems and the extent of soil quality improvement by their use. It is expected that trained paraprofessionals will make recommendations to growers from study results that reduce farming inputs, improve soil quality, save money, and increase crop yields. Growers are expected to reduce their use (and costs) of inorganic fertilizer by using high N content cover crops, which also will lead to reduction of weed control labor and herbicide costs.

• One study has focused on the use of agricultural by-products such as oat hulls and peanut shells to prepare activated carbon with high efficiency and high capacity toward heavy metal ions, namely copper (Cu<sup>2+</sup>) and lead (Pb<sup>2+</sup>), commonly found in wastewater. The developed activated carbon products were compared with the copper and lead adsorption efficiency and capacity of a commercial steam-activated carbon (CS) and a commercial phosphate-activated carbon (CP). This study showed that oat hull-based carbons pretreated with phosphate were better than the commercial coal-based carbons in copper and lead ion-binding. It was concluded that the activated carbons made from oat hulls may have the potential to be used in small scale waste water treatment and broader commercial applications.

**Total Actual Amount of professional FTEs/SYs for this State**

Year:2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	0.0	12.0
<b>Actual</b>	0.0	0.0	0.0	16.4

**II. Merit Review Process**

**1. The Merit Review Process that was Employed for this year**

- Combined External and Internal University External Non-University Panel

**2. Brief Explanation**

In 2007, North Carolina A&T submitted six proposals for approval from USDA. The procedure used in the peer review process appears below:

The research director has the primary responsibility for determining the need, priority, and scientific feasibility of the projects proposed and has a procedure for project documentation, merit review, and selection. This procedure assures that the research project proposals are scientifically sound, relevant to society's food and agricultural needs, and not duplicative of efforts undertaken elsewhere.

Prior to proposal development, alignment of the topic with the needs of the state and the direction of the six program initiatives in the School of Agriculture and Environmental Sciences is determined. Upon agreement by the department chair, the associate dean for research, and the research director, the principal investigator prepares a proposal on the topic for submission through the Evans-Allen program.

The Merit Review Process includes a review by five peer reviewers composed of persons both within and outside the university who are knowledgeable in or familiar with the area of research. The principal investigator is responsible for incorporating suggestions made by the reviewers and must give reasons for any substantive suggestions not included or addressed.

The proposal is then reviewed by the associate dean for research who determines if additional review and substantive revision is necessary. Upon acceptance by the associate dean for research and the research director, the proposal is submitted for budgetary review by the Office of Agricultural Research and then transmitted to CSREES/USDA for approval.

### **III. Stakeholder Input**

#### **1. Actions taken to seek stakeholder input that encouraged their participation**

- Targeted invitation to traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to selected individuals from general public

#### **Brief Explanation**

In addition to the formal meetings involving ARP administrators and stakeholders, the program conducted several outreach activities as a means for gathering input from those affected by the school's research activities or who use the research results. One major event was the Small Farms Week, an activity jointly sponsored by the Cooperative Extension Program and the Agricultural Research Program. During this week, farmers, commodity group representatives, and consumers attended activities both on and off campus involving Extension and research. A second major event is the Grassroots Leadership Conference. Administrators and researchers in the Agricultural Research Program participated in three conferences held in the three Extension programming regions of the state (eastern, central and mountains) to listen to the issues, concerns, and needs of farmers, community leaders, residents, volunteers, members of the Strategic Planning Council, specialized committee members and county and staff members. These grassroots conferences also assisted the Agricultural Research Program in needs assessment for proposal development and program priorities. Through these activities, SAES shared information about research underway at the University, and received input from those that use the research results. Other major outreach activities included field days that brought farmers, commodity groups, and consumers into direct contact with specific SAES research projects. Feedback was also sought about research and research related activities by the scientists, their research teams, and by staff associated with ARP and the University; the input is then shared within SAES and incorporated into future research activities.

A major statewide agenda that is affecting our research program and all aspects of the School of Agriculture and Environmental Sciences is UNC Tomorrow, an initiative by the General Administration for the 17 public state universities. This initiative involved forums across the state seeking feedback from citizens on their needs that the 17 universities need to address. One outcome from the forums and the final report is that NCA&T is beginning a program and research activities to assist the horse owners in the state and particularly in the Piedmont region of the state. Other major concerns are global readiness and economic transformation of communities. Our planned programs support multiple aspects of these goals.

#### **2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them**

##### **1. Method to identify individuals and groups**

- Use Advisory Committees
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

**Brief Explanation**

The individual and group stakeholders are identified by their membership in organizations that are agriculturally related in the state. This includes all farmer and grower groups, cooperatives and community organizations. The Dean, other administrators and many faculty members serve on many boards across the state that either also serve the stakeholders or have stakeholders on the boards.

Diverse methods are used to collect information and data on stakeholder needs. There is a proactive effort including face-to-face meetings with groups as well as reading/reviewing current documents (strategic plans, newspapers, newsletters, etc) that identify research needs of individuals and communities in North Carolina.

**2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them**

**1. Methods for collecting Stakeholder Input**

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Meeting specifically with non-traditional groups

**Brief Explanation**

The methods for collecting the information primarily is through meetings but also through surveys completed by the faculty and through published reports and white papers.

**3. A statement of how the input was considered**

- To Identify Emerging Issues
- Redirect Research Programs
- In the Staff Hiring Process
- To Set Priorities

**Brief Explanation**

Administrators and faculty use the input about stakeholder needs in determining the direction and nature of research projects as well in hiring scientists needed in the identified subject matter areas.

**Brief Explanation of what you learned from your Stakeholders**

The major input items gained this year include issues in the following areas: (1) the bioeconomy, (2) health, wellness and nutrition, (3) specialty enterprises, (4) 4-H and youth development and (5) water quality and quantity. These topics formed the discussion items for the SAES faculty summit held recently, where faculty from teaching, research and outreach met to determine ways to assure inclusion in our six planned programs.

**IV. Expenditure Summary**

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	3364044

<b>2. Totaled Actual dollars from Planned Programs Inputs</b>				
<b>Extension</b>			<b>Research</b>	
	<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
<b>Actual Formula</b>	0	0	0	3450606
<b>Actual Matching</b>	0	0	0	2845228
<b>Actual All Other</b>	0	0	0	60585
<b>Total Actual Expended</b>	0	0	0	6356419

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years</b>				
<b>Carryover</b>	0	0	0	608622

**V. Planned Program Table of Content**

<b>S. NO.</b>	<b>PROGRAM NAME</b>
1	Human and Community Development
2	Biotechnology and Biodiversity
3	Soil and Water Quality
4	Agromedicine, Nutrition and Food Safety
5	Small Scale Agriculture
6	International Trade and Development

**Program #1**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Human and Community Development

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management				20%
802	Human Development and Family Well-Being				15%
803	Sociological and Technological Change Affecting Individuals, Families and Communities				15%
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures				20%
805	Community Institutions, Health, and Social Services				30%
	<b>Total</b>				100%

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	0.0	3.0
<b>Actual</b>	0.0	0.0	0.0	4.1

**2. Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	693729
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	736688
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	12180

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

- Conduct research studies
- Develop databases
- Disseminate results in papers and presentations

**2. Brief description of the target audience**

- Individuals and families living in rural areas
- Underserved populations
- Rural communities
- Policy makers
- Community based organizations

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

**Target for the number of persons (contacts) reached through direct and indirect contact methods**

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	0	0	0	0
2007	558	394080	265	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	0
2007 :	0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	5	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Database of community-based organizations

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	0	250

**Output #2**

**Output Measure**

- # presentations at professional meetings

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	0	29

**Output #3**

**Output Measure**

- # media occurrences

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	8	0

**Output #4**

**Output Measure**

- # published articles in research and other professional journals

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	4	5

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

<b>O No.</b>	<b>OUTCOME NAME</b>
1	# organizations accessing and using database of community-based organizations
2	# policy makers who acknowledge and use data on farmland loss
3	Revision of Community Voices curricula by Extension specialists and others to include data from research study
4	# policy makers using data to reduce installation and other challenges faced by manufactured home owners.

**Outcome #1****1. Outcome Measures**

# organizations accessing and using database of community-based organizations

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services
803	Sociological and Technological Change Affecting Individuals, Families and Communities

**Outcome #2****1. Outcome Measures**

# policy makers who acknowledge and use data on farmland loss

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being
805	Community Institutions, Health, and Social Services
803	Sociological and Technological Change Affecting Individuals, Families and Communities
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures

**Outcome #3**

**1. Outcome Measures**

Revision of Community Voices curricula by Extension specialists and others to include data from research study

**2. Associated Institution Types**

- 1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2007	0	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
803	Sociological and Technological Change Affecting Individuals, Families and Communities
805	Community Institutions, Health, and Social Services
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
802	Human Development and Family Well-Being

**Outcome #4**

**1. Outcome Measures**

# policy makers using data to reduce installation and other challenges faced by manufactured home owners.

**2. Associated Institution Types**

- 1890 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2007	0	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)****What has been done****Results****4. Associated Knowledge Areas**

KA Code	Knowledge Area
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
805	Community Institutions, Health, and Social Services

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Other (See notes below)

**Brief Explanation**

As indicated in the 2008-2012 Plan of Work, we did not identify quantifiable action in these outcomes for FY07. We see these outcomes as intermediate changes that will take several years to achieve. Specific expectations appear below:

- Database for Community Based Organization--There are over 250 CBOs in the database but the database is not yet designed to be accessed by the organizations. We expect action once the database is fully developed. There is great interest expressed by the CBOs in using the information in the database.
- Policy makers using information from manufactured housing study--This will be shared with the industry and results will be reported to the industry in FY08.
- Revision of Community Voices. The study is just completed. Revision is expected in FY08.

This is an active Planned Program evidenced by the highlights in the Report Overview.

**V(I). Planned Program (Evaluation Studies and Data Collection)****1. Evaluation Studies Planned**

- During (during program)

**Evaluation Results**

{No Data Entered}

**Key Items of Evaluation**

{No Data Entered}

**Program #2**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Biotechnology and Biodiversity

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
133	Pollution Prevention and Mitigation				30%
302	Nutrient Utilization in Animals				10%
308	Improved Animal Products (Before Harvest)				30%
311	Animal Diseases				10%
403	Waste Disposal, Recycling, and Reuse				20%
<b>Total</b>					100%

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	0.0	1.8
<b>Actual</b>	0.0	0.0	0.0	2.8

**2. Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	901978
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	608272
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	15837

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

•Conduct research studies •Give presentations at professional meetings •Publish in professional journals

**2. Brief description of the target audience**

•Companies involved in biotechnology applications •Farmers involved in producing agricultural products using biotechnology and those that are considering it •Consumers

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

**Target for the number of persons (contacts) reached through direct and indirect contact methods**

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	0	0	0	0
2007	38	394080	36	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	0
2007 :	0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	16	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # articles published in research and other professional journals

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	3	16

**Output #2**

**Output Measure**

- # presentations at professional meetings

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	6	38

**Output #3**

**Output Measure**

- # media occurrences

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	0	7

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

<b>O No.</b>	<b>OUTCOME NAME</b>
1	# of licenses of current patents
2	# of filings for intellectual property

**Outcome #1****1. Outcome Measures**

# of licenses of current patents

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	0

**3c. Qualitative Outcome or Impact Statement****Issue (Who cares and Why)****What has been done****Results****4. Associated Knowledge Areas**

KA Code	Knowledge Area
311	Animal Diseases
308	Improved Animal Products (Before Harvest)
403	Waste Disposal, Recycling, and Reuse
133	Pollution Prevention and Mitigation
302	Nutrient Utilization in Animals

**Outcome #2****1. Outcome Measures**

# of filings for intellectual property

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	0

**3c. Qualitative Outcome or Impact Statement****Issue (Who cares and Why)****What has been done**

---

**Results****4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
302	Nutrient Utilization in Animals
311	Animal Diseases
403	Waste Disposal, Recycling, and Reuse
133	Pollution Prevention and Mitigation
308	Improved Animal Products (Before Harvest)

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Other (See notes below)

**Brief Explanation**

This planned program is quite active as seen from the highlights mentioned in the Report Overview section and our listed outcomes are for long term impacts. The research projects underway in the biotechnology planned program hold promise for future patents and companies involved with those patents. For example, we have one spin-off company, Provagen, reported last year, that involves a set of patents that are about 20 years old.

**V(I). Planned Program (Evaluation Studies and Data Collection)****1. Evaluation Studies Planned**

- 

**Evaluation Results****Key Items of Evaluation**

**Program #3**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Soil and Water Quality

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships				34%
112	Watershed Protection and Management				22%
133	Pollution Prevention and Mitigation				8%
205	Plant Management Systems				28%
403	Waste Disposal, Recycling, and Reuse				8%
	<b>Total</b>				100%

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	0.0	1.8
<b>Actual</b>	0.0	0.0	0.0	1.5

**2. Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	385503
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	375659
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	6769

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

•Conduct research studies •Conduct training workshops for small-scale and limited resource farmers •Participate in field days •Present findings at professional meetings •Publish research in professional journals

**2. Brief description of the target audience**

•Extension educators •Small-scale and limited resource farmers •Environmental groups interesting in preserving soil and water quality

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

**Target for the number of persons (contacts) reached through direct and indirect contact methods**

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	0	0	0	0
2007	258	394080	36	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	0
2007 :	0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	4	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # field days

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	1	3

**Output #2**

**Output Measure**

- # presentations at professional meetings

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	3	6

**Output #3**

**Output Measure**

- # articles published in research and other professional journals

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	5	4

**Output #4**

**Output Measure**

- # workshops on improved soil and water management practices

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	0	3

**Output #5**

**Output Measure**

- # media occurrences

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	4	0

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

<b>O No.</b>	<b>OUTCOME NAME</b>
1	% farmers adopting improved soil and water quality management practices
2	Development of water treatment (wetlands) for small-scale farmers

**Outcome #1****1. Outcome Measures**

% farmers adopting improved soil and water quality management practices

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	0

**3c. Qualitative Outcome or Impact Statement****Issue (Who cares and Why)**

Intensive tillage and limited reintroduction of low organic matter are two major factors contributing to soil degradation in the southeastern United States. Small scale vegetable growers need information on pre-determined combinations of practices they can adopt that will rapidly and effectively improve soil quality and crop productivity.

**What has been done**

Research has been completed that has contributed to the knowledge base in using no tillage, cover crops and compost to improve soil quality. A workshop was held to share this information with small scale producers.

**Results**

Eleven producers attended the workshop. All participants reported that the information presented was most useful to them and helpful in their on-farm operation.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems

**Outcome #2****1. Outcome Measures**

Development of water treatment (wetlands) for small-scale farmers

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	0

**3c. Qualitative Outcome or Impact Statement****Issue (Who cares and Why)****What has been done**

---

**Results****4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse
112	Watershed Protection and Management

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Other (See notes below)

**Brief Explanation****V(I). Planned Program (Evaluation Studies and Data Collection)****1. Evaluation Studies Planned**

- During (during program)

**Evaluation Results**

{No Data Entered}

**Key Items of Evaluation**

{No Data Entered}

**Program #4**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Agromedicine, Nutrition and Food Safety

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
204	Plant Product Quality and Utility (Preharvest)				10%
502	New and Improved Food Products				30%
503	Quality Maintenance in Storing and Marketing Food Products				10%
701	Nutrient Composition of Food				18%
703	Nutrition Education and Behavior				12%
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins				20%
	<b>Total</b>				100%

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	0.0	4.7
<b>Actual</b>	0.0	0.0	0.0	4.3

**2. Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	903219
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	687503
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	15858

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

•Conduct research experiments •Present findings at professional meetings •Publish research findings in professional journals •Seek patents in appropriate new discoveries

**2. Brief description of the target audience**

The target audience for this research are the following:  
 •Extension educators for use in programs and outreach activities •Companies involved in health and nutrition related products and/or food safety

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

**Target for the number of persons (contacts) reached through direct and indirect contact methods**

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	0	0	0	0
2007	74	394080	36	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	1
2007 :	0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	12	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # new patents in food and food-related discoveries

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	1	0

**Output #2**

**Output Measure**

- # presentations at professional meetings

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	4	39

**Output #3**

**Output Measure**

- # articles published in research and other professional journals

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	4	12

**Output #4**

**Output Measure**

- # media occurrences

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	5	318

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

<b>O No.</b>	<b>OUTCOME NAME</b>
1	# hispanic women adopting healthy nutrition and exercise practices
2	# of companies purchasing licenses for food and food safety related patents
3	# of adolescents reducing their overweight and obesity status

**Outcome #1****1. Outcome Measures**

# hispanic women adopting healthy nutrition and exercise practices

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	30	13

**3c. Qualitative Outcome or Impact Statement****Issue (Who cares and Why)**

The incidence and prevalence of being overweight and obese is increasing at an alarming rate among all race/ethnic groups. An estimated 129.6 million adults (64.5%) in the United States are overweight or obese. Obesity has been identified as an independent risk factor for a number of medical conditions, including type 2 diabetes, hypertension, coronary heart disease, elevated cholesterol levels, musculo-skeletal disorders, gallbladder disease, sleep apnea and several cancers. Among Hispanic women, the prevalence of age-adjusted combined overweight and obesity was higher (71.9%) when compared to non-Hispanic White women (57.3%).

**What has been done**

A pilot 12-week intervention study was completed with overweight or obese Mexican American women to improve healthy eating and exercise behaviors. This study offered a unique opportunity for Mexican-American women to participate in a culturally relevant nutrition and physical activity behavioral interventional program. The class was taught in Spanish.

**Results**

Ninety percent of the women both lost weight and reported improved food choices and eating habits. The group was small (n=13) and the program will be fully evaluated before it offered to other Mexican American women and other ethnic groups. The study collected information on which to evaluate the impact on the health of the women beyond the weight loss, such as cholesterol levels.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
703	Nutrition Education and Behavior

**Outcome #2****1. Outcome Measures**

# of companies purchasing licenses for food and food safety related patents

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)****What has been done****Results****4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
502	New and Improved Food Products
701	Nutrient Composition of Food
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**Outcome #3****1. Outcome Measures**

# of adolescents reducing their overweight and obesity status

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2007	0	0

**3c. Qualitative Outcome or Impact Statement****Issue (Who cares and Why)****What has been done****Results****4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
703	Nutrition Education and Behavior
701	Nutrient Composition of Food

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Other (Timing issues on licensing patents)

**Brief Explanation**

We expect activity involving our existing patents but it may not happen for several years. We anticipate that when the clinical tests are completed involving the allergy free "aggie" peanut, that several companies will buy the license and begin production. We definitely have witnessed interest in our patent for improved packaging of mushrooms.

**V(l). Planned Program (Evaluation Studies and Data Collection)**

**1. Evaluation Studies Planned**

- 

**Evaluation Results**

**Key Items of Evaluation**

**Program #5**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Small Scale Agriculture

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
202	Plant Genetic Resources				13%
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants				17%
205	Plant Management Systems				17%
206	Basic Plant Biology				8%
308	Improved Animal Products (Before Harvest)				13%
401	Structures, Facilities, and General Purpose Farm Supplies				32%
	<b>Total</b>				100%

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	0.0	2.4
<b>Actual</b>	0.0	0.0	0.0	3.2

**2. Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	448091
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	332820
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	7868

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

•Conduct research studies    •Provide expertise supportive in alternative crop and income stream production    •Conduct training sessions/field days for small farmers    •Present research findings at professional conferences    •Publish articles in research journals

**2. Brief description of the target audience**

•Small scale farmers/producers    •Rural entrepreneurs

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

**Target for the number of persons (contacts) reached through direct and indirect contact methods**

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	0	0	0	0
2007	788	394080	36	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	0
2007 :	0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	6	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # presentations at professional meetings

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	6	14

**Output #2**

**Output Measure**

- # articles published in research and other professional journals

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	5	6

**Output #3**

**Output Measure**

- # media occurrences

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	6	0

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

<b>O No.</b>	<b>OUTCOME NAME</b>
1	# mushroom growers
2	# lbs and sales in mushroom production

**Outcome #1**

**1. Outcome Measures**

# mushroom growers

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	384

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

With the declining tobacco crop in North Carolina, small scale producers need alternative crops to provide income from their farms. The mushroom production program is providing a viable alternative to tobacco crops for small farmers in North Carolina.

**What has been done**

The mushroom production program is providing a viable alternative to tobacco crops for small farmers in North Carolina. This is program provided by a faculty person with a split appointment in research and Extension. Workshops are continually being held to introduce growers to mushroom production.

**Results**

There are now 384 mushroom growers in the state and the state has been designated as a mushroom-growing state by USDA. The growers were surveyed to determine their specific needs and also their use of the workshops and the value to their production. Seventy-four percent of the growers responding to the survey indicated that they had benefits from the workshops in getting them started and being successful in mushroom growing.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
206	Basic Plant Biology

**Outcome #2**

**1. Outcome Measures**

# lbs and sales in mushroom production

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	186974

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Mushroom production is an alternative to tobacco production for small scale farmers. The level of production is one measure of profits.

#### **What has been done**

Small scale producers collectively had an estimated 93,487 logs in mushroom production in North Carolina in FY07.

#### **Results**

The estimated number of logs in mushroom production in North Carolina in FY07 was 93,487. With an average yield of two pounds per log, the estimated pounds of mushroom production was 186,974. The mushrooms sell at an average price of \$10 per pound; this resulted in sales of \$186,974. This represents an average of \$4,869 per mushroom producer.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
202	Plant Genetic Resources
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
206	Basic Plant Biology

#### **V(H). Planned Program (External Factors)**

##### **External factors which affected outcomes**

- Other ( )

##### **Brief Explanation**

#### **V(I). Planned Program (Evaluation Studies and Data Collection)**

##### **1. Evaluation Studies Planned**

- During (during program)

##### **Evaluation Results**

{No Data Entered}

##### **Key Items of Evaluation**

{No Data Entered}

**Program #6**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

International Trade and Development

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management				10%
602	Business Management, Finance, and Taxation				10%
603	Market Economics				15%
604	Marketing and Distribution Practices				15%
605	Natural Resource and Environmental Economics				10%
610	Domestic Policy Analysis				20%
611	Foreign Policy and Programs				20%
<b>Total</b>					<b>100%</b>

**V(C). Planned Program (Inputs)**

**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.0	0.0	0.0	1.3
<b>Actual</b>	0.0	0.0	0.0	0.5

**2. Actual dollars expended in this Program (includes Carryover Funds from previous years)**

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	118086
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	104286
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	2073

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

•Conduct research studies •Disseminate results in papers and presentations •Travel to countries to conduct research on developing markets for NC food and agricultural products

**2. Brief description of the target audience**

The target audience includes the producers in small scale agriculture and small businesses in North Carolina.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

**Target for the number of persons (contacts) reached through direct and indirect contact methods**

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	0	0	0	0
2007	338	394080	36	0

**2. Number of Patent Applications Submitted (Standard Research Output)**

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	0
2007 :	0

**Patents listed**

**3. Publications (Standard General Output Measure)**

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	2	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- # articles published in research and other professional journals

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	2	2

**Output #2**

**Output Measure**

- # presentations at professional meetings

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	5	10

**Output #3**

**Output Measure**

- # foreign trips to develop markets for NC products

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	2	0

**Output #4**

**Output Measure**

- # media occurrences

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	5	0

**V(G). State Defined Outcomes****V. State Defined Outcomes Table of Content**

<b>O No.</b>	<b>OUTCOME NAME</b>
1	Number of different NC products exported
2	Number of small farmers and businesses trained and becoming involved in export of their products
3	Percentage of increased income by farmers and businesses served by the International Trade Center
4	Percentage of stakeholders who use the information and policy research in their decision making

**Outcome #1****1. Outcome Measures**

Number of different NC products exported

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	2	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
603	Market Economics
611	Foreign Policy and Programs
610	Domestic Policy Analysis

**Outcome #2****1. Outcome Measures**

Number of small farmers and businesses trained and becoming involved in export of their products

**2. Associated Institution Types**

•1890 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	2	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Finding international markets for North Carolina agricultural products is important for the individual producers but also to the rural economies of the state.

**What has been done**

Training sessions are being held by the International Trade Center at NCA&T for especially small scale swine producers.

## Results

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
603	Market Economics
610	Domestic Policy Analysis
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
611	Foreign Policy and Programs

### Outcome #3

#### 1. Outcome Measures

Percentage of increased income by farmers and businesses served by the International Trade Center

#### 2. Associated Institution Types

•1890 Research

#### 3a. Outcome Type:

Change in Condition Outcome Measure

#### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	5	0

#### 3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

## Results

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
611	Foreign Policy and Programs
603	Market Economics
610	Domestic Policy Analysis
604	Marketing and Distribution Practices
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation

### Outcome #4

#### 1. Outcome Measures

Percentage of stakeholders who use the information and policy research in their decision making

#### 2. Associated Institution Types

•1890 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	0	0

**3c. Qualitative Outcome or Impact Statement**

Issue (Who cares and Why)

What has been done

Results

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
603	Market Economics
601	Economics of Agricultural Production and Farm Management

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Other (See notes below)

**Brief Explanation**

The outcomes tracked in this initiative are more long range in nature. The NCA&T International Trade Center is providing on-going training with farmers especially in the hog industry on the process of exporting pork as well as finding markets domestically.

**V(I). Planned Program (Evaluation Studies and Data Collection)****1. Evaluation Studies Planned**

- Before-After (before and after program)
- During (during program)
- Case Study

**Evaluation Results**

{No Data Entered}

**Key Items of Evaluation**

{No Data Entered}